Technical Service Bulletin

June 2006 TSB132.03

HYDRAcap® Module Installation Instructions and Rack Design

This Technical Service Bulletin provides information required to install HYDRAcap® Ultrafiltration modules and to demonstrate a sample support rack assembly.

General Guidelines/Rack Design

HYDRAcap® is a stand-alone module capable of withstanding a pressure of 73 psig (5bar) at 20°C. The following rules are applicable to its installation:

1. The modules should be installed vertically with the filtrate connection at the top (see figure 1). Vertical installation is highly recommended. If horizontal orientation is the only choice, the modules should be placed with the feed and concentrate ports facing upwards to avoid air entrapment.

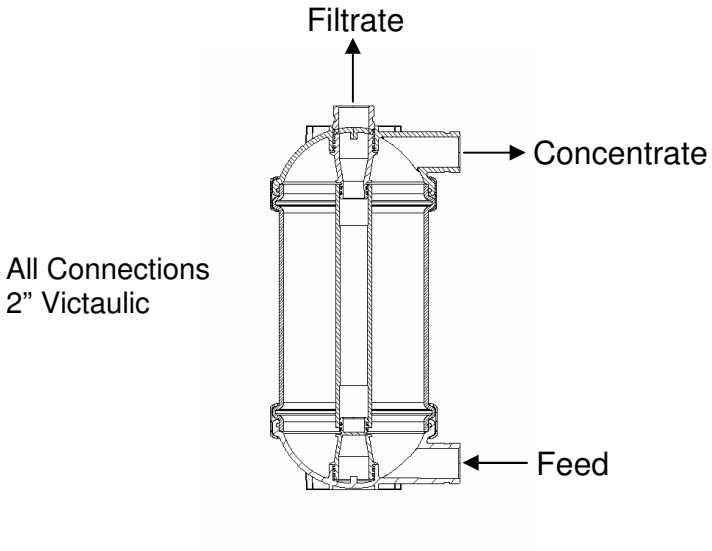

Figure 1: Flow Orientation

2. Feed water should enter the bottom of the module. Under certain conditions such as high solid loading, it may be necessary to alternate the feed direction from bottom-to-top to top-to-bottom.
3. The rack structure must be capable of supporting the weight of the HYDRAcap® modules as follows:

Module	Shipping Weight	Weight Full of Water
HYDRAcap60	97 lbs (44 kg)	177 lbs (80 kg)
HYDRAcap40	63 lbs (28 kg)	116 lbs (53 kg)

4. A suggested rack design is shown below in figure 2. Hydranautics suggests double Victaulic flexible joints to connect all three ports of each module to the rack piping for the following reasons:
   A. The thermal expansion coefficient of PVC is 3.5 $x10^{-5}$ inch/inch°F. As a result a HYDRAcap60 module can expand 4mm over a temperature range of 70°F. A double Victaulic connection can accommodate this deviation.
   B. The rack headers have a certain tolerance on the side port angles.
   C. A 3" spool piece with 2 Victaulic connections allows a port-to-port tolerance of 7 mm and can handle alignment angle issues.
5. The modules should be supported at the center of the bottom end cap. At least two straps and two saddles should be utilized to hold the modules to the support structure.
6. A 6" section of clear PVC is required in the filtrate exit line to identify modules that have lost integrity.
7. The HYDRAcap® module is preserved in a solution of 0.95% sodium bisulfite. This solution is relatively non hazardous, with NFPA ratings of the following:

   Health …… 1
   Fire ……... 0
   Reactivity … 0

   If the caps are removed from the modules,1L of this solution will drain. If the modules are to be subsequently shipped, they must be re-preserved via Hydranautics TSB131.
8. THE MAXIMUM FEED PRESSURE ALLOWED FOR HYDRAcap® IS 73 PSIG (5bar) at 20℃.

Figure 2: Sample Rack Assembly

Installation Procedure

The HYDRAcap® modules are shipped from the factory with a preservative solution. The end cap clamps are tightened and plastic caps are placed on all ports to retain the preservative. Prior to installation, the user may wish to rinse the preservative from the modules. The following is the recommended installation procedure:

1. *Clean the system and it's piping sufficiently to prevent foreign matter from entering the modules.*
2. Remove the plastic caps on the three connection ports.
3. Place the module on the support rack such that the bottom end cap is supported near its center. Hold the modules in place with two straps that

attach to the support structure. Utilize curved saddles to cushion the modules to the support rack.

4. If needed, loosen the end clamps such that the upper and lower ports can be mechanically adjusted to line up with the side ports on the headers. Line up the ports and then tighten the end cap clamps such that there is no gap between the metal ends.
5. Connect all ports starting with the bottom (feed) port and working up. A spool piece with double Victaulic connections is recommended. Tighten all Victaulic clamps. Slowly pressurize the system and check for connection leaks.
6. Flush thoroughly with permeate or city water.

Hydranautics
401 Jones Rd.
Oceanside, CA 92054
Tel: (760) 901-2500
Fax: (760) 901-2578
email: info@Hydranautics.com